

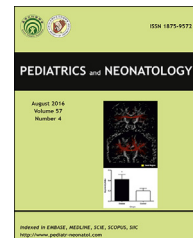


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Letter to the Editor

A case of a full-term newborn with severe craniotabes due to insufficient maternal sunlight exposure during the COVID-19 pandemic

To the Editor:

An increasing number of term newborns with neonatal rickets due to vitamin D (VD) deficiency presenting with craniotabes have been reported in recent years.¹ Here, we report a full-term newborn with severe craniotabes due to insufficient maternal sunlight exposure during the COVID-19 pandemic.

A previously healthy 30-year-old Japanese woman, with no outstanding family history, infectious disease history or drug use, became pregnant with her first child in August 2021 in Osaka. Owing to the COVID-19 pandemic, she restricted her daily activities outside the house. She experienced threatened premature labor at 20 weeks gestation, which later exacerbated and was complicated by hypertension from 35 weeks onward. Owing to this, she had been strictly staying home until delivery at 38 weeks gestation. Upon physical examination of her male newborn, we detected wide sagittal and lambda sutures with generalized craniotabes which were particularly severe around the posterior fontanel and parietal bones. These were confirmed by cranial three-dimensional computed tomography on the first day of life (Fig. 1 A–D). No other apparent skeletal abnormalities were found. The infant had a low serum 25-hydroxyvitamin D (25-OHVD) (10.3 ng/mL, normal range: >20 ng/mL), slightly high serum alkaline phosphatase (ALP), and normal calcium and phosphorus levels. Therefore, VD-deficiency rickets was

diagnosed. After he was fed with breast milk and standard formula (which contains 340 IU/L of VD) for 2 weeks, the craniotabes showed a dramatic improvement, with a palpably harder skull than at birth. He then recovered to an almost normal level by 4 months of age (Fig. 1 E–H). His serum 25-OHVD was also normalized.

The mother's serum 25-OHVD was 9.1 ng/mL at delivery. A previous report showed that most mothers who delivered newborns with neonatal rickets had serum 25-OHVD <10 ng/mL.² Ninety percent of daily VD is acquired from sunlight exposure. In winter, 22 and 271 min of sunlight on the hands and face at noon and 3 pm, respectively, is required for adults to produce 220 IU/day of VD in Japan at a latitude similar to that of Osaka,³ while the recommended VD intake for pregnant women is 340–600 IU/day. This would explain the mother's VD deficiency, as her third trimester was in winter. Lack of VD in a pregnant woman can lead to insufficient calcium supply to the fetus, resulting in neonatal rickets.⁴ This can be prevented by regularly monitoring serum 25-OHVD and ALP and ensuring sufficient sunlight exposure and VD supplementation during pregnancy. To prevent VD deficiency in pregnant women as well as in their fetuses and newborns, the required duration of sunlight exposure changes depending on season, time of day, latitude, skin type, and lifestyle⁵: it can be very short in summer and may need to be long (without sunscreen) at around noon in winter, particularly in high latitude areas.

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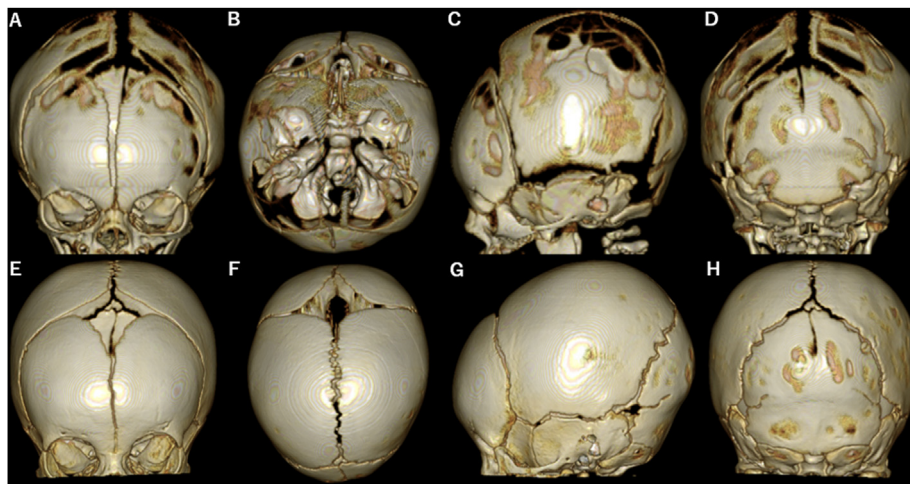


Figure 1 Three-dimensional reconstructed cranial computed tomography showed multiple sites of extensive craniotabes, particularly on the parietal bones, with delayed ossification along the sagittal and lambda sutures (A–D). A nearly completely ossified skull was confirmed at 4 months of age (E–H).

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Informed consent

The parents of our subject provided their informed consent for all published information, including facial CT images.

Declaration of competing interest

The authors declare that they have no conflict of interest.

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Natsumu Arai

Department of Neonatology, Izumiotsu Municipal Hospital,
Izumiotsu, Japan

Department of Pediatrics, Osaka Metropolitan University
Graduate School of Medicine, Osaka, Japan

Naoyuki Matsunami

Nagisa Yamamoto

Department of Neonatology, Izumiotsu Municipal Hospital,
Izumiotsu, Japan

Jingang Li*

Department of Neonatology, Izumiotsu Municipal Hospital,
Izumiotsu, Japan

Department of Pediatrics, Osaka Metropolitan University
Graduate School of Medicine, Osaka, Japan

*Corresponding author. Gejyo-cho 16-1, Izumiotsu, Osaka,
595-0027 Japan.

E-mail address: s-ri@hotmail.co.jp (J. Li)

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